

REMARKS

Claims 1-37 were presented for examination in the present application. The instant amendment cancels claims 6-7 and non-elected claims 23-27 without prejudice. Thus, claims 1-5, 8-22, and 28-37 are presented for consideration upon entry of the instant amendment. Claim 1 is independent.

The Office Action made final the requirement for restriction and withdrew non-elected claims 10, 12, and 20-21. Claims 10, 12, and 20-21 have been withdrawn, but remain pending for rejoinder upon allowance of a generic claim. Claims 1-8, 11, and 14-18 have been acknowledged by the Office Action as being generic.

Claims 1 and 16 have been amended to correct obvious errors. Claim 1 has been amended to change "less than" to "greater than" and claim 16 has been amended to change "the the" to "the". It is submitted that these amendments merely make explicit what had been implicit in the claims.

Claims 1-9, 11, 13-19, 22, and 28-37 were rejected under 35 U.S.C. §112, second paragraph.

Claim 1 has been amended to clarify the "molar substances quantities" element, specifically to recite a " $B_2O_3/(B_2O_3 + SiO_2)$ ratio".

Claim 8 has been amended to provide proper antecedent basis to all elements, namely to change "the region of" to "a region of the walls of the skull crucible that is surrounded by". Similarly, claim 14 has been amended to provide proper antecedent basis to all elements, namely to change "in the form of pellets" to "in pellet form".

Claim 19 has been clarified to recite that the boron-containing melting material is "melted in a first appliance and refined in a second appliance connected in series with the first appliance".

Applicants submit that claims 28-37 are definite as filed. Specifically, Applicants submit that claims 28 and 34 each depend from claim 1 and, thus, there is no need for M(II) in these claims to have the same scope. Further, M(III) is not recited in claim 28 at all such that clarification of this non-recited element is not required.

Applicants submit that these arguments and amendments obviate the rejection to the claims under section 112. Accordingly, reconsideration and withdrawal of the 112 rejections are respectfully requested.

Independent claim 1, as well as dependent claims 2-7, 11, 13-19, and 22, were rejected under 35 U.S.C. §103(a) over International Publication No. WO/2001/53222 to Kunert et al. (Kunert) in view of U.S. Patent No. 6,713,419 to Onozawa et al. (Onozawa). Dependent claims 8-9 were rejected under 35 U.S.C. §103(a) over Kunert and Onozawa in further view of U.S. Patent No. 6,817,212 to Romer et al. (Romer). Claim 1, 29, and 37 were was rejected under 35 U.S.C. §103(a) over Kunert in view of U.S. Patent No. 3,193,400 to Geffcken (Geffcken). Claims 1 and 28 were rejected under 35 U.S.C. §103(a) over Kunert in view of U.S. Patent No. 5,648,302 to Brow et al. (Brow). Claims 1 and 30 were rejected under 35 U.S.C. §103(a) over Kunert in view of U.S. Patent No. 4,358,544 to Skedgell (Skedgell). Claims 1 and 30-36 were rejected under 35 U.S.C. §103(a) over Kunert in view of U.S. Patent No. 3,963,505 to Dumesnil (Dumesnil).

Claim 1 has been amended to include elements of claims 6 and 7, which have been cancelled. Thus, claim 1 now recites that the appliance comprises "a skull crucible in which the boron-containing melting material is melted, the skull crucible has walls that comprise **cooled tubes that are spaced apart from one another by a spacing of between 2 mm and 4 mm** (emphasis added)". Further, claim 1 now recites the step of "supplying coolant to the cooled tubes to **prevent the boron-containing melting material from running out from between the spaced apart cooled tubes** (emphasis added)".

The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, (3) the level of skill in the art, and (4) where in evidence, so-called secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). See also *KSR*, 127 S.Ct. at 1734 ("While the sequence of these questions might be reordered in any particular case, the [*Graham*] factors continue to define the inquiry that controls.")

Applicants respectfully submit that the Office Action has failed to meet its burden of establishing a prima facie case of obviousness because the Office Action has failed to determine the level of skill in the art.

Presuming *arguendo* that the references show the elements or concepts urged by the Office Action, the Office Action has presented no line of reasoning, and we know of none, as to who one skilled in the art is or why that person viewing the collective teachings of the references would have found it obvious to selectively pick and choose various elements and/or concepts from the several references relied upon to arrive at the claimed invention. Rather, Applicants submit that the collection of references supports the inescapable conclusion that the Office Action has simply pieced the references together to support a rejection on the basis of hindsight.

Furthermore, Applicants submit that the claimed combination does much more than yield predictable results.

The Office Action asserts with respect to the claimed spacing that Kunert's figure 1 illustrates spacing between the tubes, but fails to indicate what the spacing is. Rather, the Office Action asserts that it would have been obvious to have the spacing as large or as small as needed. Applicants respectfully disagree.

First, Applicants submit that it is well established that patent drawings do not define the precise proportions of the elements and may not be relied on to show

particular sizes if the specification is completely silent on the issue. See In re Wright, 569 F.2d 1124, 1127, 193 USPQ 332, 335 (CCPA 1977) ("Absent any written description in the specification of quantitative values, arguments based on measurement of a drawing are of little value."). Kunert does not disclose that its drawings are to scale and the specification is completely silent on whether patent drawings define the precise proportions of the elements. Thus, Applicants submit that Kunert may not be relied on to show the precise proportions of the elements (i.e., whether the tubes are spaced out or not) and may not be relied on to show particular sizes of any spaces should they be present.

Second, the court in In re Meng, 492 F.2d 843 (CCPA 1974) has made a determination of obviousness in a situation analogous to the instant situation. The issue in Meng involves a utility patent drawing alleged to render the pending patent application at issue obvious. The facts of this case include prior art references void of any written content to the claimed invention, and the only alleged disclosure of the claimed limitation at issue was present in a portion of one of the drawings. According to Meng, the question to answer was: "would one of ordinary skill in the art, presented with that problem and those ...prior patents -- and totally unaware of appellants solution-- be led to do what appellants did?" (id at 846).

The Meng court did not find the claim at issue obvious in view of the reference. The court arrived at this conclusion "against the background of the scope and content of the prior art, and the level of ordinary skill in the art" (id at 846). The court noted that when the references were read "without the benefit of appellants' teachings", it had nothing to do with the invention at issue. The court went on to say "we are further stayed from a holding of obviousness when, as here, the drawing occurs in a reference in no way directed toward the problem involved, and the drawing must be viewed in a teaching vacuum so far as the invention before us is concerned" (id at 848). In doing so, the court upheld the well-established rule "references must be evaluated by ascertaining the facts fairly disclosed therein as a whole" In re Schuman 361 F.2d 1008, 1012, 53 CCPA 1251, 1255 (1966) (emphasis added).

Applicants submit that it would not have been obvious to one skilled in the art, when viewing the figures of Kunert to have the claimed spacing.

In the present application, the spacing of the tubes is not dependent upon the crucible's dimensions in the manner asserted by the Office Action, but dependent upon the melt's properties with the melt having a particular high content of B_2O_3 as compared to SiO_2 , as evidenced by the claimed $B_2O_3/(B_2O_3 + SiO_2)$ ratio.

As explained at page 11, line 13 to page 13, line 6 of the present application description, two parameters are used in dimensioning the tubes' spacing. On one hand, the extremely low viscosity at melting temperature plays a role, due to that only a thin skull layer will be formed, and this layer will be unable to withstand the weight of the melt. Thus, the danger of the melt breaking through is caused. In order to avoid this, the distance between the tubes should be as small as possible and amount to 5 mm at the maximum (page 12, lines 14 to 22). On the other hand, there is an increasing risk of flashovers between the metal tubes with the spacing of the being reduced. Therefore, the tubes' spacing should be at least 2 mm according to the invention (page 12, lines 27 to 35).

Present claim 1 provides the optimum spacing, namely **between 2 mm and 4 mm**, which has been found to address the aforementioned effects.

The Office Action fails to assert that any of the remaining references, namely Onozawa, Romer, Geffcken, Brow, Skedgell, or Dumesnil disclose or suggest the claimed spacing.

Accordingly, Applicants submit that the Office Action has failed to establish a prima facie case of obviousness and has failed to establish or even assert that present claim 1 does not produce new and unpredictable results. As such, Applicants submit

that claim 1, as well as claims 2-5, 8-9, 11, 13-19, 22, and 28-37 that depend therefrom are allowable over the proposed combination of cited art. Reconsideration and withdrawal of the rejection to claims 1-5, 8-9, 11, 13-19, 22, and 28-37 are respectfully requested.

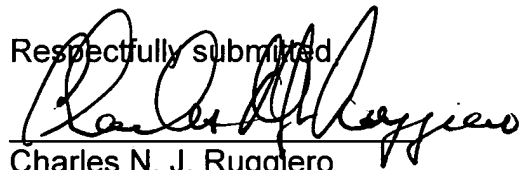
Further, Applicants respectfully request rejoinder of withdrawn claims 10, 12, and 20-21, which depend from allowable present claim 1.

In view of the above, it is respectfully submitted that the present application is in condition for allowance. Such action is solicited.

If for any reason the Examiner feels that consultation with Applicants' attorney would be helpful in the advancement of the prosecution, the Examiner is invited to call the telephone number below.

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Respectfully submitted



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